

7530-274-5494
FEDERAL SUPPLY SERVICE

Kristensen's



Preservative For Tardigrades and Other
Minute Critters



Am. sodium borate ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$) 2 g.
Saturate seawater with sodium b. Add enough formalin
to make a 8% solution. Dilute
with dH₂O to make a 4% formalin solution
when ready for use. —H—

Higgins modification:

Saturate seawater as above w/ sodium borate. Add enough formalin
to make a 12% solution. Dilute with dH₂O to make a 6% formalin
solution when ready to use.

Kristensen's



For Tardigrades and Other
Minute Critters



1. Saturate seawater (Na₂CO₃ 10g/l) with a
small amount of seawater to saturate. (3.4g/l
seawater to make a 1% solution. Dilute
with dH₂O to make a 4% formalin solution
when ready for use.

Higgins modification:

Saturate seawater as above w/ sodium borate. Add enough formalin
to make a 12% solution. Dilute with dH₂O to make a 6% formalin
solution when ready to use.

Echinoderes juv. - middorsal spines start on
6th segment + go back

Centrodorres - middorsal spines go 20
the way of head on juveniles

"X" - thinner + longer body
shorter terminal
spine relative to body length
2 or 3 large dorsal sp.

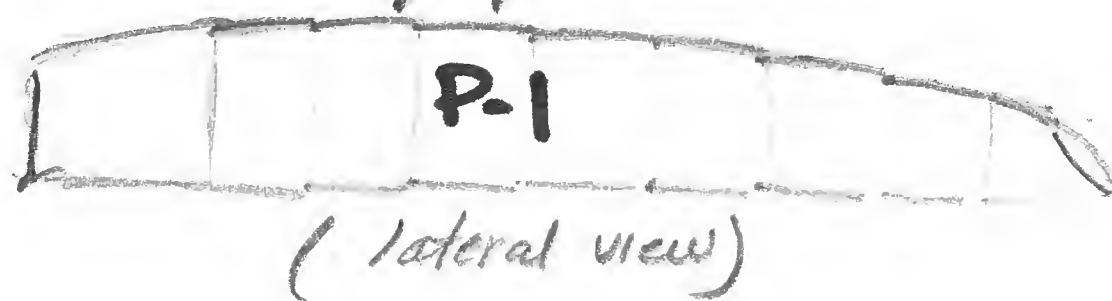
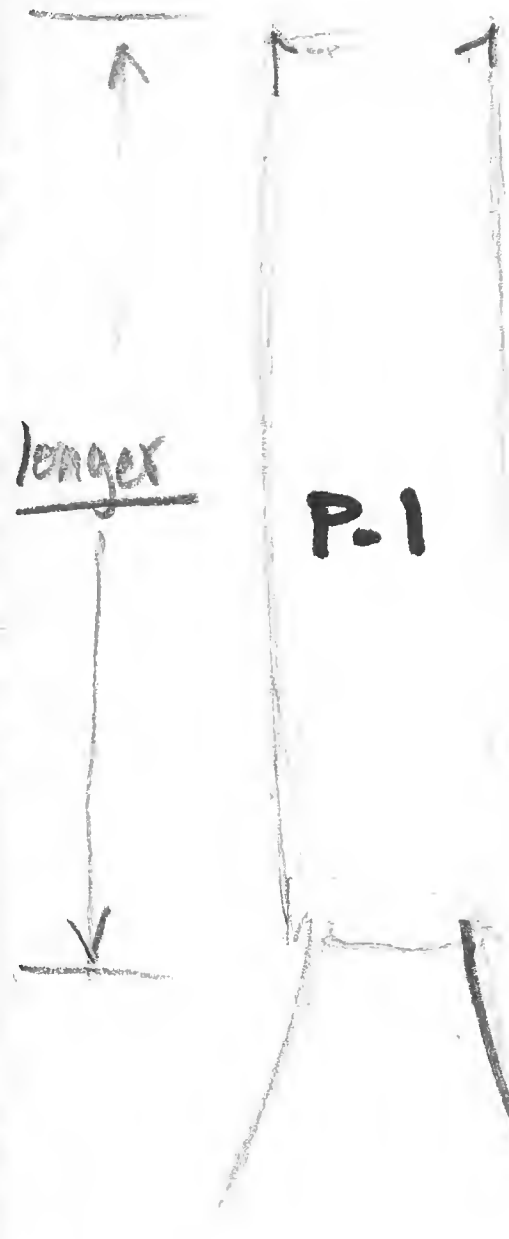
Semnodorres - longer terminal spine
relative to short chubby body - 1st trunk
segment squared

Catusa - doesn't have dorsal spines on
all segments

COMMON

no "humps"

Rare



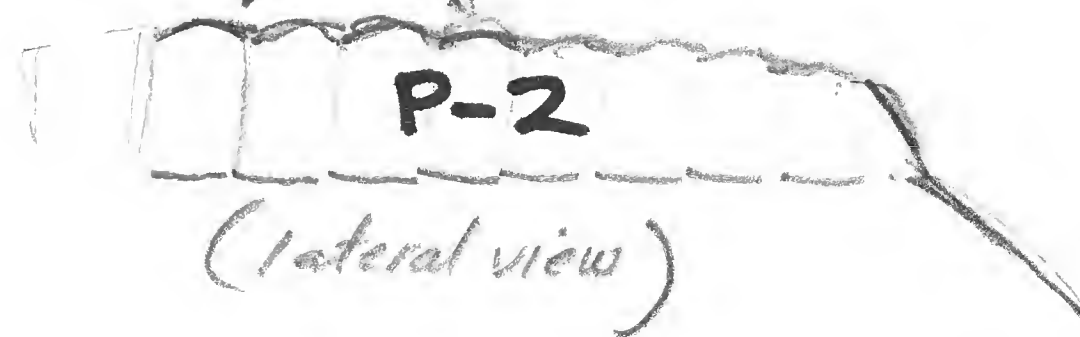
P-1

P-2

P-2

shorter

Thick, straight
(or less curved)
"humps"



Centrodones or x?

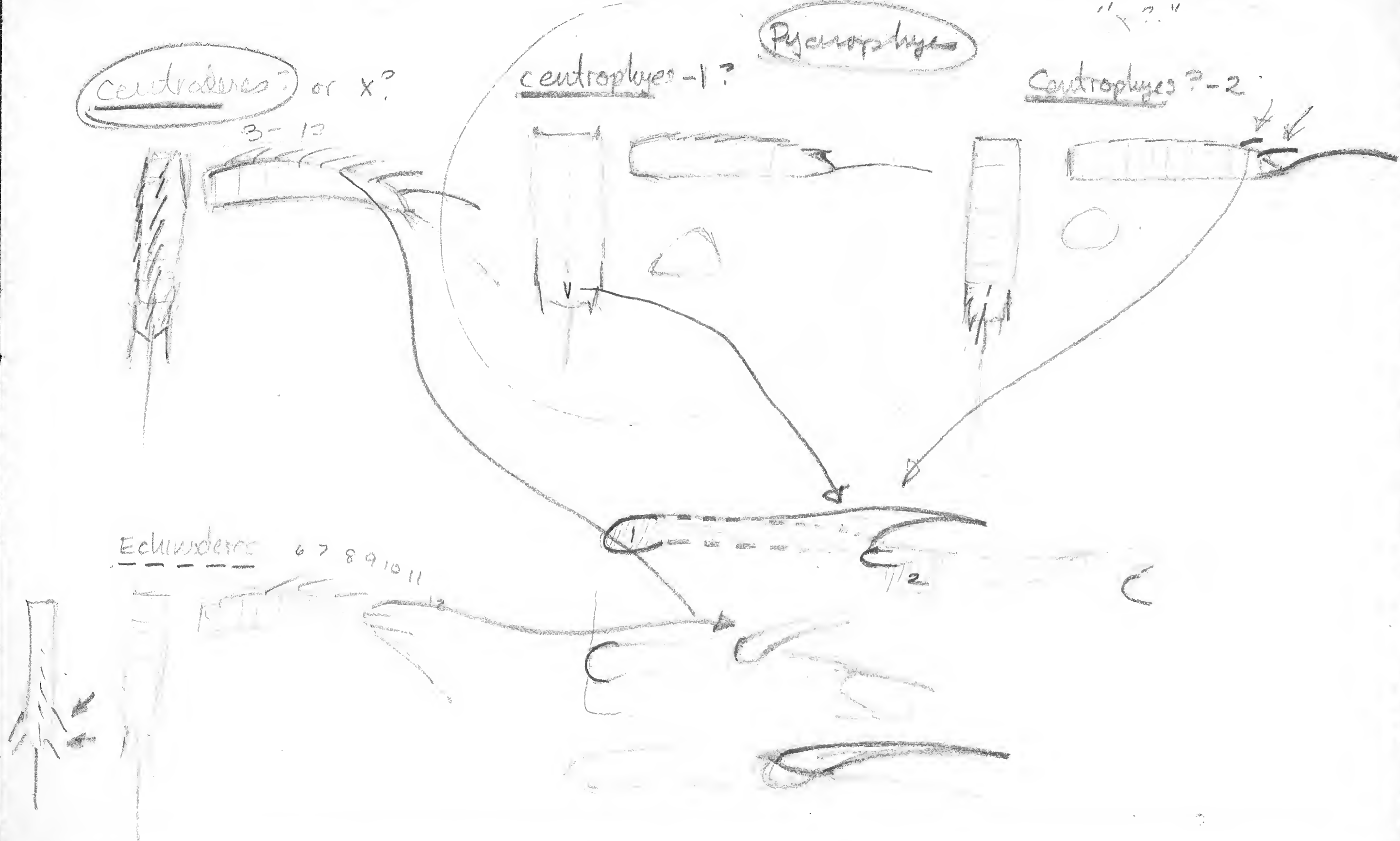
centrophyes - 1?

Pycnophyes

Centrophyes ? - 2

3-10

Echinoderm 6 7 8 9 10 11



840403.1

RH 1953

Collected 1 Nautical Mile SSE of Loggerhead
Key, ~ 60' depth

R/V Bellowe, Graduate Marine Biology
Class Florida Atlantic Univ

84° 55' W

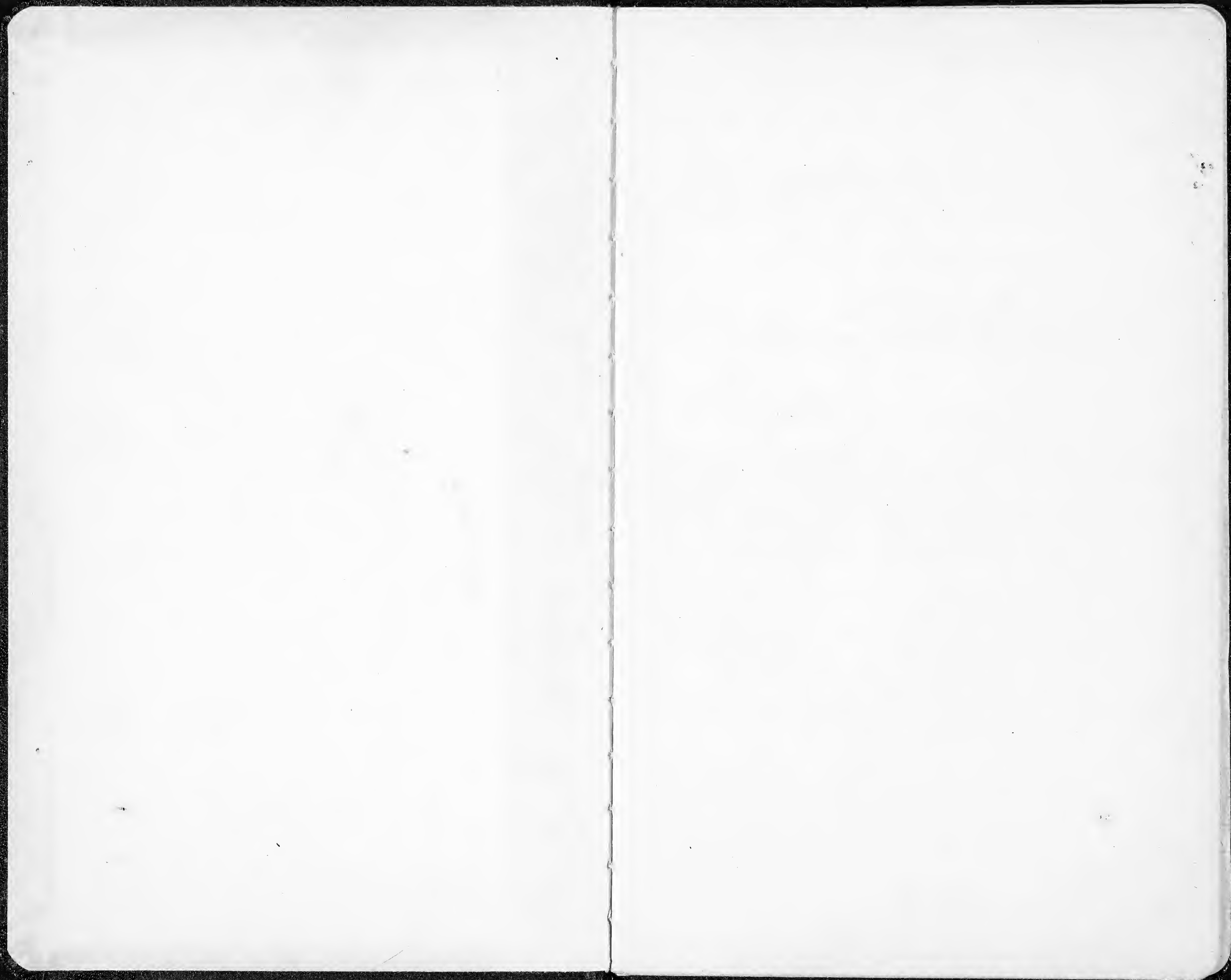
24° 38.5' N

W. D. LEE

Halimeda rubble with gray mud

1 - 1 dram vial

1 60 ml bottle residue



"KRISTENSEN'S" FORMALIN

1. Add sodium borate (BORAX) ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$) to a given volume of filtered sea water until saturated
2. Add enough full strength formalin to make an 8% (12%)* solution [this is a stock solution]
3. Dilute stock solution with equal volume to make a 4% (6%)* solution when ready to use.

* this modification allows for compensation of excess sea water added during bulk processing of sediment

Cruise No. Two. 16

2-1-82

Coor: RPH & MLW

Approx. location - 20 nautical miles offshore

Ft. Pierce

Temp. 74°

820201.1 Sample # 3

RH 1559

Time in 1:30

Time out 1:35

5 min.

Loran C in: 14407.28

43238.30

Depth: 72 fathoms

Loran C out: 14408.40

43245.47

Samples completely sorted

Acc. 348815

Cruise No. 16

Sample # 4

Time in 1:46

" out 2:00

14 min.

Loran C in: 14409.07

43249.93

Loran C out: 14410.40

43257.69

Sample washed out

Copepods + a few mites + turbellarians

1 Bottle of residue left
Some

Acc. 348815

Sample # 5

820201.2

RH 1560

Time in 2:10

" out 2:27

17 min + 30 min to retrieve

Sample had more sediment - muddy
sand

Loran C in 14410.38

43260.19

Loran C out 14411.50

43269.38

Depth: 64 fathoms

In order of abundance

Most abundant: Pycnophyes (2 species) ^{Many} pycnophyes

Centrodere

Kinorhynchus

Semnodere

Echinodere

↓ Few

"

with extruded eggs

Misc. invertebrates: some tanaids, some polychaetes
Some nematodes, numerous ostracods, some

Date: 4-5-82

Cruise No. 18

Collectors: Higgins, Wallace, Reichardt

Approx. location: Gulf Stream

Temp. 78°F

Salinity 61 ref index

Sample 1

Time In 1147

Time Out 1200

Total time: 13 minutes

Locan C 14405.4

43229.8

Depth 66 fms

Little sediment

820405.1 =
Samples 1 + 2
combined
+ completely sorted
RH1561

Sample 2

Time In 1220

Time Out 1230

Total time 10 minutes

Locan C 14405.9

43230.4

Depth: 66 fms

Cruise No: 18

Sample 3

Time In: 1240

Time Out: 1251

Total time: 11 min.

Loran C 14407.6
43240.9

Depth: 67 fms.

Sample lost

Sample 4

Time In: 1257

Time Out: 1310

Total time 13 min

Loran C 14408.8
43249.6

Didn't get a sample

Sample 5 — 820405.2 RH 1562

Time In: 1325

Time Out: 1337

Total time 12 min.

Loran C 14410.8
43263.8

Pipe dredge

Not completely
sorted

Date: 6-2-82

Cruise No: Trs. Cruise 19

Collectors: Robert Higgins, M. Wallace, JB Pirano

Hugh Reckardt

Approx. Location: Gulf stream

Temp. 80° Salinity: 35 ‰

Sample 1

820602.1

Time In 10:36

Time Out 10:51

15 minutes

Loran C: 14405.12

43231.32

Depth: 72½ fathoms Anchor dredge
133 meters

RH 1598

Sample 2

820602.2

Time In: 10:52

Time Out: 11:07

15 minutes

Loran C: 14406.94

43241.81

Anchor dredge

Completely
sorted

RH 1599

Sample 3

Time In: 11:32

Time Out: 11:48

16 minutes

Loran C: 14407.21

43236.89

Higgins' meio-benthic dredge
Sample lost

Date: 6-2-82

Cruise No: Trs. Cruise 19

Collectors: Robert Higgins, M. Wallace, J.B. Pircano
Hugh Reichardt

Approx. Location: Gulf Stream
Temp. 80° Salinity: 35 ‰

Sample 1

820602.1

Time In: 10:36

Time Out: 10:51

15 minutes

RH 1598

Loran C: 14405.12

43231.32

Depth: 72½ fathoms Anchor dredge
133 meters

Sample 2

820602.2

Time In: 10:52

Time Out: 11:07

15 minutes

Loran C: 14406.94

43241.81

Anchor dredge

Completely
sorted

RH 1599

Sample 3

Time In: 11:32

Time Out: 11:48

16 minutes

Loran C: 14407.21

43236.89

Higgins' meibenthic dredge
Sample lost

RH 1218

RH 1218

Semnodontes - much broader than x from
lateral view - thin from ventral
view

Washbottles

yellow = alc

red = formalin

blue = sea

clear = dist.

green = alc w/ glyce

solid red = 75%

red tube = 6%

Tape

Blue - Tard

Red - Lins

Green - give away

White - unsorted

Yellow - residue

Cruise No: 18

Sample 3

Time In: 1240

Time Out: 1251

Total time: 11 min.

Loran C 14407.6
43240.9

Depth: 67 fms.

Sample lost

Sample 4

Time In: 1257

Time Out: 1310

Total time 13 min

Loran C 14408.8
43249.6

Didn't get a sample

Sample 5 — 820405.2 RH 1562

Time In: 1325

Time Out: 1337

Total time 12 min.

Not completely
sorted

Loran C 14410.8
43263.8

Pipe dredge

Date 8-2-82

Cruise No. 20

Collectors, Reichardt, Higgins + Wallace

Approx loc. Gulf Stream

Temp. 85°

Salinity 35‰

Sample 1

820802.1

Time In: 11:12

RN 1625

Time Out: 11:30

18 min.

Loran C 43215.80

61924.53

Depth: 74 fathoms

Anchor dredge

300 m. of line released

Sample completely sorted

Sample 2

820802.2

Time In: 11:44

RN 1626

Time Out 12:00

16 min.

Loran C. 43227.90

61921.91

Depth: 72 fathoms

300 m of line released
Anchor dredge

Pycnophyes sp. 1 - most abundant

Many pycnophyes juveniles

Centroderes
"x"

No ~~Centroderes~~ Semnoderes
Few Kinorhynchus + Echinoderes

P₂ = short + robust

P₁ = long, skinny

"x" = thin, long middorsal spines

whereas Semnoderes has short

middorsal spines - along all segments - as antennae

Sample completely sorted
only on last few segments

00°2E pendak

RH 1832

upward ahead

RH 1832

upward ahead

Acceptable ranges
~~43228~~ 43228 - 43230²
61923 } starting coordinates for next sample
61922 - 61925

Take coordinates beginning time when
300 m are in + when he begins
to retrieve wreck.

NITEX Net:

TETKO, Inc
420 Saw Mill River Road
Elmsford NY 10523
914-592-5010

can not identify
00000 - 00000 - 00000
can not identify
00000 - 00000

will minimize disturbance
avoid all other + no use on OOE
lower intensity at

Date: 4 Oct. 1982

Cruise No. 23

Collectors

Approx loc. 0

Temp 84°

Salinity 35‰

Sample #1 & 2 - no sample retrieved w. box corer

Sample #3 - a little sediment - box corer
821004.1

Time In: 12:01

Time Out: 12:06

5 min.

Loran C in: 43229.8
61923.1

Loran C out: 43230.3
61923.0

Depth: 68 fathoms

No kinorhynchids!

130 meters + slack of line let out!

Sample #4 Box corer - no sample

Sample #5 - Anchor Dredge

Time In: 12:40

821004.2

Time Out 12:54

Depth: 14 min.
69 fathoms

Loran C in: 43232.7
61921.0

Loran C Out: 43231.4
61922.3

RH 1630

Good sample!
Pyenophyes sp 1 most
abundant
Centrodoris - next most
abundant (over)

Some sp "x" + Semnodontes sp
Few Kinorhynchus + few Echinoderes

"x" has been more abundant than in previous sample

"P₂" - more abundant than in previous samples.

Not completely sorted - on 12/9/82 -
sorted residue down in Ft. Pierce -
consequently we have 2 sets of sorted
vials.

Fish House Cove, Ft. Pierce, FL.

Oct. 7, 1982

821007.1

Loc. Fish house cove

Gear Dredge

Coll. RPH, Woody

Depth: 1 meter

Sample #2

821007.2

Gear - Core

Loc. Fish house cove

Coll: RPH / Woody

} Kinorhynchus
| Psychropleges sp

Woody has samples

Date: 6 Dec. 1982

Tss. Cr: 24

Collectors: Higgins, Wallace et al

Approx location: Gulf Stream

Temp: 76°F

Salinity 35 ‰

Time In: 10:46

Time Out: 11:00

Total 14 min

821206.1

RN1653

Loran C. 43230.9
61920.6
43232.5
61919.1

Depth: 10 fathoms
Anchor Dredge

Only 1 sample taken
~~all~~ aliquots taken.

Tardigrades

821206.2A

Loc. 27°30.0' N, 80°11.2' W

Depth: 48 ft

Amphioxus - coarse sand shell

6 mi E Ft Pierce

16 m depth

821206.2B fresh water.

shock

Vibrionellaceae = from both .2A + .2B

RN1654

Date: 31 Jan 1983

Tro. Cr. 25

Collectors: Higgins, Wallace, Richardt, Lee

Approx. loc: East Fj. Pierce Inlet

Temp. 76° F

Salinity: 35‰

830131.1

Time In: 10:55

RH 1660

Time Out: 11:02

Total 7 min

Loran C: 43226.2
61922.3

Depth: 68 fathoms (approx 124 meters)

Equip.: Box Core
(Bucket #1) - 3 separate cores

830131.2

Time In: 11:46

RH 1661

Time Out: 12:00

14 min

Loran C: 43230.7 (In)
61921.8

43233.2 (Out)
61925.6

Depth: 68 fathoms
Equip.: Anchor Dredge (Buckets #2+3)

6391 no. 18 : 3 to 6
 26.22 an
 at throat of canal (approx. 1/2 m. below)
 whole area 9 ft. high : soil. very
 or 22 ft. high : 1 ft. high

23:01 : mile time : [1.121028]
 60:11 : (1/2) mile
 min. 1

5.25524 : 2 m. 1/2
 5.52712

(Larkin #51) (approx. 82 : 1/2 m. 1/2
 can. 1000 ft. E - (1/2 m. 1/2) : 1/2 m. 1/2
 (1/2 m. 1/2)

24:11 : mile time : [5.121028]
 60:21 : (1/2) mile :
 min. #1

(mile) : 5.02524 : 2 m. 1/2
 3.16712

(Larkin #51) 6.02524
 3.26712
 smallish 82 : 1/2 m. 1/2
 (Larkin #51) (approx. 82 : 1/2 m. 1/2)
 (Larkin #51) (approx. 82 : 1/2 m. 1/2)

Tad. Gr. 25 (continued)

[830131.3]

Time In: 12:10
 Time Out: 12:30
 20 min.

[RH 1662]

Loran C. 43231.4 (In)
 61924.7

43231.2 (Out)
 61926.6

Depth: 62 fathoms
 Equip. Anchor Dredge
 (Bucket # 4)

[830131.4]

Time In: 16:07
 Time Out: 16:17
 10 minutes

Does
 Reinhardt
 Jones
 res. 1/2

Loran C. 43318.91 (In)
 62008.69

43319.48 (Out)
 62009.05

[RH 1663]

Depth: 15 meters
 Equip. Anchor Dredge
 Fresh water shock (formalin-preserved)
 Cateria? Schindler's spp.
 Pyrosophyes sp. Antrodia, "X" ?
 (Bucket 5)

Quintiles 26.2.41

01:51 : only one
08:51 : two one
num 06

E.181088

(ml) H.18584 : 2 marks
T.H.5713

(two) E.18584
2.58713

smaller 60 : 18584
phase 6 island : 18584
18584

H.181088

03:21 : only one
07:21 : two one
num 01

(ml) 18.51884 : 2 marks
P.3.80063

(two) 18.51884
20.80063

smaller 21 : 18584
phase 6 island : 18584
(intermediate - intermediate) : 18584

830201.1

1 Feb 1983
1600 hrs EST

Beach at Pepper State Park, Ft Pierce
Interstitial sample taken at High tide mark
3/4 + way to low tide at low tide.
Coarse to medium sand 36‰ S
28°C ~~25-45~~ CM horizon
25-50

Reinhardt has

fresh water shocked, Kristensen formalin
preserved

Coll. Higgins and Lee

830205.1

Beach at Howard Johnson's
Islamorada, Florida (etc)
seal is missing
Echinoderes

RH1664

Big Pine Key
Collectors: Higgins, M. L. Wallace, Jim Thomas

830206.1

Sheriff's Island Channel

Fine grey mud

NMD

Pycnophyes & Echinoderes

RH1665

830206.2

Newfound Harbor Channel

Marker 3

NMD

RH1666

830206.3

Newfound Harbor Channel

Coupon Right near power lines

Depth: 1 meter

Pycnophyes, Echinoderes

RH1667

830206.4

$\frac{1}{4}$ mile SW Marker #2

fw shock (Ramhard had)

RH1668

830206.5

400 yards SW Sheriff's Island

Fine mud

1 meter depth

RH1669

Coll Date:

5 April 1983

Cruise No. Tars. Cr. 26

Approx location: E of Ft Purie

Temp: 75° F

Sample 830405.1 + 830405.2 - no
sediment obtained w. box corer

Sample 830405.3

Time In: 11:06

Time Out: 11:36

30 min.

Loran C In: 43228.6

61920.5

Out: 43229.3

61924.8

Most abundant = P. litten C

Some Leptodermes

Few Echinoderes

Few "X"

Very few P₂

RH1681

Depth: 66 fathoms

Equip: Anchor Dredge

Good sample!

6 Mile Station

71° F

Samples 546 -
plankton
tows

Sample 830405.6

RH1682

Time In: 14:38

Time Out: 14:52

14 min.

1801111

6801111

8.204055

Loran C In: 43296.06
62005.31

Out: 43299.40
62006.08

Depth: 55 feet
Equip. Anchor Dredge

Bucket #5 + #6

Clean shell sample 1 w shell

Sample 830405.7

Time In: 15:09

Time Out: 15:20

11 min.

Loran C In: 43319.68
62006.88

Out: 43317.24
62005.41

Depth: 50 feet

Equip: Anchor Dredge
No sample!

Bucket 5
Echinoderes
+ Pyrosophyes

30.3968H : only 3 marks
1E.30053

34.3968H : (u)
80.30053

Tool 23 : 11/10/6
when 1st mark . 11/10/6
1st 2nd mark

[5.304058] signed

80:31 : only mark
82:31 : (u) mark
dim 11

34.3968H : only 3 marks
38.30053

46.3968H : (u)
14.30053

Tool 23 : 11/10/6
when 1st mark : 11/10/6
signed off

Sample [83 04 05.8]

Time In: 15:40
Time Out: 15:48
8 min.

[RH 1683]

Locan C In: 43319.8
62015.3

Locan C Out: 43319.5
62015.4

Bucket 8
To Judy
Winston

Depth: 45 feet
Equip: Anchor Dredge

Buckets #7+8 (lots of rocks)

Muddy sand, 7A = $\frac{1}{2}$ FW shock, 7B = $\frac{1}{2}$ for BB
Good sample 1 Tardigrad + Kimo
Sample [830405.9] Echinoderm

Time In: 15:55
Time Out: 16:03
8 min

Bucket #9
To
John Neurenberg

Locan C In: 43316.6
62014.7

[RH 1684]

Out: 43313.8
62014.0

Depth: 45 feet
Equip: Anchor Dredge
Shell (not much mud)

9A $\frac{1}{2}$ FW
shock
+ decanting

Buckets #9+10

[8.2040 E8] Signal

[E8J1A9]

14:21 : only unit 1

24:21 : two unit 1

num 8

8.91284 : only 2 marks

8.31063

3 Trench
mark 1 at
mark 11

2.91284 : two 3 marks

4.31063

Tech 34 : Signal 6
above 6 marks : Signal

mark 1 at 345 : Signal

[P.3040 E8] Signal

01st Trench

22:21 : only unit 1

20:21 : two unit 1

num 8

[P8J1A9]

2.91284 : only 2 marks
8.31063

8.91284 : two

8.31063

Tech 34 : Signal 6

above 6 marks : Signal

1st P. 345

June 7, 1983

830607.1

GEAR: HMD

Bucket #1

[RN 1685]

Muddy

In 43292.9
62003.8

27° 29.24' N
80° 10.17' W

Time In 8:36

Time Out 8:47

Depth: 60 feet

Out: 43294.7
62004.5

27° 29.32' N
80° 10.31' W

Bucket #2

830607.2

[RN 1686]

Time In: 8:57

Out 9:08

In 43295.4
62006.9

27° 29.21' N
80° 10.70' W

Out: 43296.3
62006.6

27° 29.29' N
80° 10.66' W

GEAR: HMD

Depth: 47 feet

Clear - less mud

Special - amphipods
Cateria

830607.3

[RN 1687]

Bucket #3

Time: 9:20

9:33

In: 43305.1
62007.0

27° 30.02' N
80° 10.98' W

Depth: 48 ft

Out: 43306.5
62006.5

27° 30.17' N
80° 10.95' W

GEAR: HMD

830607.4

RH1688

Bucket #4

In: 43302.4
62001.9

27° 30.16 N
80° 10.14 W

Out: 43304.0
62000.4

27° 30.39 N
80° 09.96 W

Depth: 58 ft

Muddy

Time: 9:45
10:00

GEAR: HMD

830607.5

RH1689

Bucket #5

In: 43310.2
62002.0

27° 30.80 N
80° 10.40 W

Out: 43310.9
62001.2

27° 30.92 N
80° 10.28 W

Time: 10:11
10:26

Depth: 59 feet
GEAR: HMD

830607.6

RH1690

Bucket #6

In: 43314.1
62007.1

27° 30.77 N
80° 11.27 W

Out: 43315.2
62006.4

27° 30.93 N
80° 11.19 W

Time: 10:38
10:55

Depth: 49 feet
GEAR: HMD

8306 1401

RH1691

Date: 14 June 1983

Coll.: Woody Lee & Hugh Richardt

Loc: Approx 20 nautical miles E. of Ft. Pierce

Depth: 117 m.

Time in: 14:54

15:10

16 min.

Loran C: 43231.1

Ln. 61923.0

Loran C : 43231.8

Out 61924.3

GEAR: Anchor Dredge

830726.1

Coll. Date: 26 July 1983

Cruise No: Tru. V. Q.

Approx location: E of Ft. Pierce

Temp: 86°F

Time In: 11:24

Time Out: 11:40

Depth: 66 fathoms

16 min

Loran C In: 43229.4

61922.8

Loran C Out: 43237.7

61922.9

Equipment: Anchor Dredge
No sample knot untied

830726.2

Time In: 12:09

Time Out: 12:20

11 min.

RH 1692

Loran C In: 43231.6

61921.9

Loran C Out: 43235.1

61923.8

Depth: 64 fathoms

Equip: Anchor Dredge.
Very little sediment Bucket #1

830726.3

Time In: 12:44
Time Out: 12:51
11 min.

Loran C In: 43230.3
61921.4

Loran C Out: 43236.4
61921.5

Depth: 67 fathoms
Equip: Anchor Dredge
No sample
Bucket #2

830726.4

Time In: 13:26
Time Out: 13:38
12 min.

Loran C In: 43231.8
61921.8

Loran C Out: 43244.7
61922.3

Equip: Anchor Dredge
No sample - knot untied
Depth: 69 fathoms

Samples 5 & 6 - plankton tows

830726.7

830726.7

830726.7 "8 mile site" actually
taken approx 8 miles offshore

Time In: 16:43

Time Out: 16:53

10 min.

Loran C In: 43288.6
61992.4

RH 1693

Loran C Out: 43288.4
61991.6

Depth: 66 feet
Equip: Anchor Dredge
Good sample
Bucket #3

Echinoderms
Caterpillars

830726.8 - Locality - approx 7 miles
E. Ft. Pierce Inlet

Time In: 17:05
Time Out: 17:15
10 min.

Loran C In: 43292.4
61998.3

RH 1694

Loran C Out: 43291.9
61998.5

Depth: 61 feet
Equip: Anchor Dredge
Buckets #4 & #5

SIX-MILE-SITE 04 OCT 83
sample taken w/ anchor dredge, ship in ~100m circle

831004.1 STA (A)

Time in: 0855 Time out: 0859
Depth in: 54 ft Depth out: 50
Loran C in: 43349.5 Loran C out: 43350.2, 62018.2
Sed. Type: 62018.0 Bucket no. 1

worm rock area, ^{mud} coarse sand w/ much silt

RH1817

831004.2 STA (B)

Time in: 0915 Time out: 0927
Depth in: 56' Depth out: 53'
Loran C in: ~~43344.9~~ 43344.9, 62010.8 Loran C out: 43344.9, 62010.7
Sed. Type: Bucket no. 2

coarse sand w/ Amphipods

RH1818

831004.3 STA (C)

Time in: 0940 Time out: 0952
Depth in: 54' Depth out: 49'
Loran C in: 43341.0 62003.7 Loran C out: 43341.8, 62003.7
Sed. Type: 30.0 04.0 Loran C out: 3
Bucket # → 3

coarse sand, relatively clean

RH1819

Sherry Petry is sorting all samples from
04 Oct. 1983 cruise

831004.4 STA (F)

Time in: 1005 Time out: 1017
Depth in: 58' Depth out: 56'
Loran C in: 473 30.0 Loran C out: 43329.6
620 04.0 62018.3
Sed Type: Bucket no. 4

mud in coarse sand, first bucket mostly mud
second mostly coarse sand but very silty

subtle fraction 4' - carbon,

RH1820

831004.5 STA (E)

Time in: 1030 Time out: 1041
Depth in: 58' Depth out: 56 ft
Loran C in: 33.9 11.3 Loran C out: 43333.8
62010.9
Sed Type: Bucket no. 5

coarse sand, much shell, silty

RH1821

831004.6 (D)

Time in: 1052 Time out: 1102
Depth in: 48' Depth out: 45'
Loran C in: 43338.7 / 62018.2 Loran C out: 43338.9, 62018.3
Sed Type: finer sand Bucket no: 6

mixed w/ coarse & shell, some silt

RH1822

831004.7 Sta (G)

Time in 1115

Depth in 35'

Loran C in 43326.6 62017.9

Sed type med sand,
little silt

Time out 1125

Depth out 35'

Loran C out 43327.2,
62018.3

Bucket no. 7

RH 1823

831004.8 Sta (H)

Time in 1135

Depth in 54'

Loran C in 43321.9 / 62011.1

Sed type

med-coarse, little silt

Time out 1144

Depth out 48'

Loran C out 43322.5 / 62011.3

Bucket no. 8

RH 1824

831004.9 Sta (I)

Time in 1157

Depth in 55'

Loran C in 43319.1 / 62003.7

Sed type

med coarse w/ shell

Time out 1206

Depth out 49'

Loran C out 43320.4 / 62004.2

Bucket no. 9

RH 1825

831004.10 Sta (J)

Time in 1230

Depth in 55' 43325.1 61997.1

Loran C in

Sed

Time out 1243

Depth out 50'

Loran C out 43325.9 / 62097.1

Bucket (w/o handles)

RH 1826

Six Mile Site 6 Dec. 1983 Temp: 76°F
Locality: 6-8 mi. offshore Near: Anchor
831206.1 Dredge

Time in: 9:25 Time Out: 9:37
Depth in: 62 ft. Depth Out: 63 ft.
Loran C in: 43336.30 61997.34
Loran C out: 43335.93 61996.07
Sediment Type: Medium sand, shell hash
Bucket no: 1 & 2 RH1827

831206.2
Time in: 9:51 Time Out: 10:02
Depth in: 59 ft. Depth Out: 58 ft.
Loran C in: 43324.9 61997.1
Loran C out: 43325.2 61997.5
Sediment Type: Medium sand, shell hash
Bucket no: 3 & 4 w. amphipus
RH1828

831206.3
Time in: 10:19 Time Out: 10:30
Depth in: 57 ft. Depth Out: 52 ft.
Loran C in: 43311.1 61996.8
Loran C out: 43312.1 61996.3
Sediment Type: Slightly finer shell hash
Bucket no: 5 & 6

Good Asteria hemimodares + landigrodes RH1829

831206.4
Time in: 10:48 Time Out: 11:01
Depth in: 61 ft. Depth Out: 60 ft.
Loran C in: 43305.4 62003.2
Loran C out: 43307.1 62003.0
Sediment Type: Medium sand, clean shell hash w.
Bucket no: 7 Scallops

RH1830

831206.5
Time in: 11:24 Time Out: 11:34
Depth in: 64 ft. Depth Out: 65 ft.
Loran C in: 43302.4 61997.7
Loran C out: 43301.7 61996.2
Sediment Type: Coarse sand, shell hash w
Bucket no: 8 & 9 amphipus
RH1831

831206.6
Time in: 11:50 Time Out: 12:01
Depth in: 59 ft. Depth Out: 64 ft.
Loran C in: 43299.0 61990.2
Loran C out: 43297.1 61991.4
Sediment Type: Medium sand, shell hash
Bucket no: 10 & 11 RH1832

[Note: add ~ 5 ft to depth reading ^{when recording} because of instrument position]
Ship in ~ 100 m circle

831206.7 - Plankton tow

Date: 6 Dec. 1983

Time In:

Time Out:

Loran C:

Depth:

Fleming - 42835

Temp.

Hugh's Sample

Sherry Petry - completed samples as of
12/7/83 - anything labelled
just kinorhynch - difficult to identify
3 Core samples taken on Jan. 31, 1983
Cores # 3, 4 & 5

RH1660

830131.1 3A: Pyenophyes - 10
Echinoderes - 10
Sennoderes - 5
Centroderes - 6
Cateria - 4
Unknown - 1

Various invertebrates - 89

830131.1 3B: Echinoderes - 14
Centroderes - 1
Pyenophyes - 13
Unknown - 1 (juv. ?)
Various invertebrates - 16

830131.1 3C: Pyenophyes - 2
Kinorhynch - 1
Unknown - 1
Various invertebrates - 3

830131.1 3D: No animals

830131.1 3E: Various invertebrates - 6

830131.1 3F: No animals

830131.1 3G: Various invertebrates - 1

Sherry Petry - completed samples
 RH 4660 continued

830131.1 4A : Pyenophyes - 12
 Echinoderes - 13
 Cateria - 4
 Semnoderes - 2
 Unknown - 5
 Various invertebrates - 55
 Solenogaster - 1

830131.1 4B :
 Kinorhynchs - 20
 Pyenophyes - 17
 Echinoderes - 6
 Centroderes - 2
 Various invertebrates - 11

830131.1 4C : Pyenophyes - 1
 Various Invertebrates - 12 (mostly polychaetes)

830131.1 4D : Various invertebrates - 6
 No kinorhynchs!

830131.1 4E : No kinorhynchs, Tardigrades
 no Loriciferans found

830131.1 4F : Various invertebrates - 2
 No kinorhynchs

830131.1 4G : No invertebrates or kinorhynchs

Sherry Petry - completed samples

RH 1660 - continued

830131.1 5A: Cateria - 1
Pycnophyes - 6
Echinoderes - 12
Sennoderes - 1
Paracentrophyes - 1
Various invertebrates - 23

Remarks: 1 Specimen (Echinoderes) set
aside for photography

830131.1 5B: Pycnophyes - 10
Centrodereis - 1
Cateria - 2
Echinoderes - 1
Kinorhynchs - 6
Unknown - 1
Various invertebrates - 11

830131.1 5C: Various invertebrates - 3

830131.1 5D: Various invertebrates - 7

830131.1 5E: Various invertebrates - 2

830131.1 5F: No animals

830131.1 5G: No animals

Date: 22 Sept 1983

Collectors: Sherry Petry and Woody Lee

Sherry Petry - Cores sampled 9/22/83 = 3 stations
Station B RH1814-RH1816 were sampled

B-1-1 830922.2 1.1

Tardigrades - 1

Cateria - 5

Misc. - 169 (122 copepods)

B-1-3 830922.2 1.3

Misc. - 48

B-2-1 830922.2 2.1

Misc. - 61

B-2-2 830922.2 2.2

Misc. - 13

830922.2 2.3

Misc. - 20

830922.2 3.1

Cateria - 3

Misc. - 91

831004.1

Anchor Dredge

Misc. - 19

Pepper State Park, North Hutchinson Island, Ft. Pierce, FL
Feb. 8, 1984

840208.1

Collectors: RPH, Reinhardt Kristensen, MLW
+ Sherry Petry

Locality: Pepper State Park, 10 meters north of
north boundary line, 8 meters
from high tide mark (19 meters
from sign.)

Depth: (70°E)

Temp: 15°C

Substrate: sand sample taken.

840208.2

Locality: Pepper State Park, 10 meters north
of north boundary line, 7 meters
from high tide mark (18 meters from
sign)

Depth: 7 meters (50-75)

Temp: 16°C

Substrate: sand

840208.3

Locality: Pepper State Park, 10 meters north
of north boundary line, 6 meters
from high tide mark (17 meters
from sign)

Depth: 75-1

Temp: 18°C

Six-Mile-Lite

R/V Morning Watch

Collectors: RPH, Reinhardt Kristensen, MLW,
Sherry Petry, Julie Luciano + Hugh Reichardt

Loc: Six miles east of Ft. Pierce, Florida
Time

840209.1

RH1877

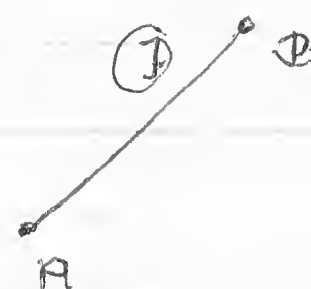
Time In: 11:30

Time Out 11:45

A 6.7^B
6.5 miles offshore
Depth: 60 feet.
Depth: 55 feet.

Scan In: 43321.1
619948

Scan Out: 43325.5
Sediment: 619933



Bucket No: 1

Black, coarse sand; dredge $\frac{1}{2}$ full

840209.②

RH1878

Scan In

43319.4

Depth: 55 feet

Time: 12:03

620022

Scan Out

(43318.2)

Depth: 55 ft

Time: 12:17

62004.1

43318.2

Time: 12:20

620050

Depth 50 ft

Good, sample. coarse Amphioxus -
mixed with sand.
black

840209. (3)

RH 1879

in Time: 12:35 Depth: 45 ft Sonar: 433149
620122

out. Time: 12:47 Depth: 45 ft Sonar: 433154

620134

Fine amphipods sand Bucket 3

Tardigrada:

840209. 1, 2 and 3

Batillipes nov. sp. 1

" nov. sp. 2

Batillipes dicrocerus

Tanarctus dentriticus

Tanarctus nov. sp.

Rauarctus colonis

Tilobarctus natans

Archannelida:

Saccocirrus sp.

Protobranchius sp.

Dicobranchius sp.

Loricifera (840209.2)

Nanoloricus mysticus

Trunk shell: Interstitial Dentalium
(840209.2)

Six Mile Site

Oct. 16, 1984

Collectors: Hugh Reichardt, Woody Lee,
Sherry Pebley, MHW & RPH

841016.1

Time In: 9:18

Time Out: 9:28

Loran C In: 43310.1
62004.8

Loran C Out: 43309.4
62003.7

RH 1954

Depth: 58 ft

Gear: Anchor Dredge

Sediment: Shell hash

Fauna: *Rimodolus* (*Echinus* & *Semmodus*) tardigrades,
starfish, ostracods, spicules

841016.1A

Time In: 9:35

Time Out: 9:45

Loran C In: 43310.6
62004.0

Loran C Out: 43311.0

Depth: 14396.6

Gear: Anchor Dredge

Sediment combined w. #1

841016.2

Time In: 9:58

Time Out: 10:08

Loran C In: 43320.4
14398.1

Loran C Out: 43320.7 14398.2

Gear: Anchor Dredge

Sediment: Shell hash

841016.3

Time In: 10:19

Time Out: 10:29

Loran C In: 43320.1
14400.0

RH 1956

Loran C Out: 43320.4
14400.0

Gear: Anchor Dredge

Sediment: coarse sand mixed w. shell

Fauna: *Lipinulans*, *Rimodolus* (*Pycnop*, *Echinus* & *Semmodus*)
tardigrades

841016.4

Time In: 10:40

Time Out: 10:50

Loran C In: 43309.8
14399.9

RH 1957

Loran C Out: 43309.9
14400.0

Gear: Anchor dredge

Sediment: Coarse sand

841016.5

Time In: 11:12

RH 1958

Time Out: 11:17

Loran C In: 43299.9

14397.9

Loran C Out: 43300.0

14398.0

Gear: Anchor Dredge

Sediment: Coarse sand

Fauna: crustaceans, misc. tardigrades,
Sipunculid & Echinoderes, many tardigrades
in residue

841016.6

Time In: 11:35

Time Out: 11:40

Loran C In: 43300.0

RH 1959

14396.1

Loran C Out: 43300.7

14396.2

Gear: Anchor Dredge

Sediment: Coarse sand with shell

